CLAIMS:

1. A method of sharpness enhancement of an input signal comprising

detecting in a first spatial direction a first subset of edges in the input signal to obtain a first detector signal,

detecting in the first spatial direction a second subset of edges in the input signal to obtain a second detector signal, said second subset being different from the first subset,

determining a peaking factor by using a predetermined two-dimensional enhancement function allocating values for the peaking factor to combinations of values of the first detector signal and the second detector signal, and

multiplying the first detector signal with the peaking factor to obtain a peaked signal.

2. A method of sharpness enhancement as claimed in claim 1, wherein

the detecting the first subset of edges comprises high-pass filtering the input image signal to obtain a high-pass filtered signal,

the detecting the second subset of edges comprises band-pass filtering the input image signal to obtain a band-pass filtered signal,

the determining the peaking factor by using a predetermined two-dimensional enhancement function being adapted for allocating values for the peaking factor to combinations of values of the high-pass filtered signal and the band-pass filtered signal, and

multiplying the high-pass filtered signal with a multiplying factor based on the peaking factor.

3. A method of sharpness enhancement as claimed in claim 2, wherein

the high-pass filtering comprises horizontal high-pass filtering a horizontal component of the input image signal to obtain a horizontal high-pass filtered signal,

the band-pass filtering comprises horizontal band-pass filtering the horizontal component of the input image signal to obtain a horizontal band-pass filtered signal, and

the determining of the peaking factor comprises using a predetermined two-dimensional horizontal enhancement function for allocating values for a horizontal peaking factor to combinations of values of the horizontal high-pass filtered signal and the horizontal band-pass filtered signal.

4. A method of sharpness enhancement as claimed in claim 3, wherein said horizontal enhancement function has a relatively low value if

(i) a value of the horizontal high-pass filtered signal and a value of the horizontal band-pass filtered signal are substantially equal,

(ii) the value of the horizontal high-pass filtered signal is larger than a first predetermined value, or

(iii) the value of the horizontal band-pass filtered signal is larger than a second predetermined value, and

wherein, if (i) is not valid, said horizontal enhancement function has a relatively high value if:

(iv) the value of the horizontal high-pass filtered signal is smaller than the first predetermined value, or

(v) the value of the horizontal band-pass filtered signal is smaller than the second predetermined value.

5. A method of sharpness enhancement as claimed in claim 3, wherein the method further comprises

vertical high-pass filtering a vertical component of the input image signal to obtain a vertical high-pass filtered signal,

vertical band-pass filtering the vertical component of the input image signal to obtain a vertical band-pass filtered signal,

the determining of the peaking factor comprises using a predetermined two-dimensional vertical enhancement function for allocating values for a vertical peaking factor to combinations of values of the vertical high-pass filtered signal and the vertical band-pass filtered signal.

6. A method of sharpness enhancement as claimed in claim 5, wherein said vertical enhancement function has a relatively low value if

(i) a value of the vertical high-pass filtered signal and a value of the vertical band-pass filtered signal are substantially equal,

(ii) the value of the vertical high-pass filtered signal is relatively large, or

(iii) the value of the vertical band-pass filtered signal is relatively large, and wherein said vertical enhancement function has a relatively high value if

(iv) the value of the vertical high-pass filtered signal is relatively small and (i) is not valid, or

(v) the value of the vertical band-pass filtered signal is relatively small and (i) is not valid.

7. A method of sharpness enhancement as claimed in claim 5, wherein the multiplying comprises

multiplying the horizontal high pass filtered signal with the horizontal peaking factor to obtain a horizontal correction factor,

multiplying the vertical high pass filtered signal with the vertical peaking factor to obtain a vertical correction factor,

summing the horizontal correction factor and the vertical correction factor to obtain a total correction factor, and

summing the total correction factor to the input image signal.

8. A method of sharpness enhancement as claimed in claim 7, wherein the summing of the horizontal correction factor and the vertical correction factor comprises weighting the horizontal correction factor with a horizontal weighting factor, and the vertical correction factor with a vertical weighting factor, wherein the horizontal weighting factor has a lower value when the vertical correction factor surpasses a first threshold, and wherein the vertical weighting factor has a lower value when the horizontal correction factor surpasses a second threshold.

9. A method of sharpness enhancement as claimed in claim 7, wherein the method further comprises determining a level of noise being present in the input image signal, and modifying the horizontal peaking factor and/or vertical peaking factor in dependence on the level of noise in order to reduce an enhancement of noise.

10. A method of sharpness enhancement as claimed in claim 9, wherein the determining of the level of noise comprises estimating a standard deviation of the noise.

11. A method of sharpness enhancement as claimed in claim 3, wherein the input image signal represents an image formed by a matrix of pixels, a position of a pixel in the matrix being defined by indices m,n wherein the index n indicates a horizontal position and the index m indicates a vertical position, and wherein the horizontal high-pass filtering comprises Laplacian filtering defined by Zx(m,n)=2L(m,n)-L(m,n-1)-L(m,n+1), and wherein the horizontal band-pass filtering comprises filtering defined by Dx(m,n)=L(m,n+1)-L(m,n-1), and wherein L(m,n) is related to the luminance of a pixel at position m,n, L(m,n-1) is related to the luminance of a pixel at position m,n-1, and L(m,n+1) is related to the luminance of a pixel at position m,n+1.

12. A method of sharpness enhancement as claimed in claim 5, wherein the input image signal represents an image being formed by a matrix of pixels, a position of a pixel in the matrix being defined by indices m,n wherein the index n indicates a horizontal position and the index m indicates a vertical position, and wherein the vertical high-pass filter comprises a Laplacian filter defined by Zy(m,n)=2L(m,n)-L(m-1,n)-L(m+1,n), wherein the vertical band-pass filter is a filter Dy(m,n)=L(m+1,n)-L(m-1,n), and wherein L(m,n) is related to the luminance of a pixel at position m,n, L(m-1,n) is related to the luminance of a pixel at position m-1,n, and L(m+1,n) is related to the luminance of a pixel at position m+1,n.

13. A method of sharpness enhancement as claimed in claim 10, wherein the estimating of the standard deviation comprises determining for each pixel for a 3 by 3 pixels window:

$$ro(m,n)=1/8 \sum_{i=-1}^{1} \sum_{j=-1}^{1} \left| L(m+i,n+j)-vgl(m,n) \right|$$

wherein vgl(m,n) is an approximation of an average value of the luminance values of the pixels in the 3 by 3 pixels window.

14. A method of sharpness enhancement as claimed in claim 13, wherein the average value is determined by vgl(m,n)=L(m,n)**W1, wherein ** denotes a convolution,

and W1 is a convolution mask indicating a weighting factor for each of the pixels in the 3 by 3 pixel window.

15. A method of sharpness enhancement as claimed in claim 14, wherein for each pixel a histogram is calculated with the following expression:

$$h(k)= \begin{cases} \left| \{(m,n) \mid k-1/2 <= ro(m,n) < k+1/2\} \right| & \text{if } k=1, 2, \ldots, kmax, \text{ or} \\ 2 \left| \{(m,n) \mid 0 <= ro(m,n) < 1/2\} \right| & \text{if } k=0, \end{cases}$$

wherein $|\{\ldots\}|$ denotes the number of elements of the set $\{\ldots\}$,

and wherein an estimated value for a standard deviation of the noise level is the value k=M corresponding to the highest value in the histogram, and wherein the horizontal peaking factor and the vertical peaking factor depend on said estimated value.

16. A method of sharpness enhancement as claimed in claim 1, wherein

the detecting the first subset of edges comprises high-pass filtering the input image signal to obtain a first high-pass filtered signal,

the detecting the second subset of edges comprises high-pass filtering the input image signal to obtain a second high-pass filtered signal,

the determining the peaking factor by using a predetermined two-dimensional enhancement function being adapted for allocating values for the peaking factor to combinations of values of the first high-pass filtered signal and the second high-pass filtered signal, and

multiplying the first high-pass filtered signal with the peaking factor.

17. A method of sharpness enhancement as claimed in claim 16, wherein

the first high-pass filtering comprises horizontal high-pass filtering a horizontal component of the input image signal to obtain a first horizontal high-pass filtered signal,

the second high-pass filtering comprises horizontal high-pass filtering the horizontal component of the input image signal to obtain a second horizontal band-pass filtered signal, and

the determining of the peaking factor comprises using a predetermined two-dimensional horizontal enhancement function for allocating values for a horizontal peaking factor to combinations of values of the first horizontal high-pass filtered signal and the second horizontal high-pass filtered signal.

18. A method of sharpness enhancement as claimed in claim 17, wherein the method further comprises

first vertical high-pass filtering a vertical component of the input image signal to obtain a first vertical high-pass filtered signal,

second vertical high-pass filtering the vertical component of the input image signal to obtain a second vertical band-pass filtered signal,

the determining of the peaking factor comprises using a predetermined two-dimensional vertical enhancement function for allocating values for a vertical peaking factor to combinations of values of the first vertical high-pass filtered signal and the second vertical high-pass filtered signal.

19. A sharpness enhancement circuit comprising

a first edge detector for detecting in a first spatial direction a first subset of edges in the input signal to obtain a first detector signal,

a second edge detector for detecting in the first spatial direction a second subset of edges in the input signal to obtain a second detector signal, said second subset being different from the first subset,

a means for determining a peaking factor by using a predetermined two-dimensional enhancement function allocating values for the peaking factor to combinations of values of the first detector signal and the second detector signal, and

a multiplier for multiplying the first detector signal with the peaking factor to obtain a peaked input signal.

20. A display apparatus comprising a matrix display and a sharpness enhancement circuit as claimed in claim 19.